

Organic Farming amongst Settled Fulani Communities in North- Eastern NIGERIA

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ABSTRACT

The study was conducted to investigate the agricultural systems practiced by settled Fulani communities in North-Eastern Nigeria. Data collected from 1,000 farmers revealed that 95% of the farmers, practice organic farming through the use of crop rotation, bush fallowing, green manure, compost and biological pests and parasites control to maintain soil fertility without the use of synthetic fertilizers, herbicides, pesticides, animal and plant growth regulators, livestock feed additives and generally modified organism. About 90% of the farmers use animals for pre and post emergence weeding of farm lands and only 10% occasionally use family labour and tractor. Organic farming was found to be a production system that was economical and efficient. It sustains the productivity of animals, crops and soils and it is environmentally friendly. Fulani men allow livestock dung to accumulate for a year and incorporate it into the soil during the rainy season to cultivate crops for bounty harvest. Organic farming was found to combine tradition, innovation and science to benefit the shared environment. There was very good productivity of both the cereals and livestock.

Key words: Organic Farming, Fulani Communities, North- Eastern Nigeria

INTRODUCTION

Organic farming is the type of agriculture that relies on crop rotation, green manure, compost, biological pest control, and mechanical cultivation to maintain soil fertility and control pests and parasites without the use of synthetic fertilizers, herbicides and pesticides, animal and plant growth regulators, livestock feed additives and generally modified organism [1, 2]. Organic agricultural methods are internationally regulated and legally enforced by many nations, based in large part on the standards set by the International Federation of Organic Agriculture Movements (IFOAM), an international umbrella organization established in 1972. Organic agriculture is the production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic farm is a farm whose structure is formed in imitation of the structure of a natural system that has the integrity, the independence and the benign dependence of an organism. Organic livestock and crop production is possible only to the farmers that practice mixed farming. About 75% of the world's rural poor depend on livestock in providing manure and animal protein which become component of their livelihoods [3]. Scientific studies have proven that a number of plants used in human ethno-medical practice have pharmacological activities and may be useful as ethno-veterinary remedies [4, 5]. In Nigeria, Fulani herdsmen who keep animals as a means of livelihood have been involved in the treatment of animal diseases and parasites even prior to the onset of modern medicine [6, 7]. There is limited information on the systems of organic farming in Nigeria, Africa and the world. The study aimed at providing vital

information on all aspect of organic farming and to know the agricultural systems practiced by settled Fulani communities in North-Eastern Nigeria.

MATERIALS AND METHODS

Data were obtained from five States of North- Eastern Nigeria, namely Adamawa, Bauchi, Borno, Gombe and Taraba for the period of 5 cropping seasons (June, 2007 to July, 2012). Data on various aspects of organic livestock production and cultivation of maize, guinea corn, millet, cowpea and ground nut were collected from 1, 000 farmers randomly selected, 200 from each State. Other methods used included farmers participatory appraisals, verbal interview and visual observation.

DISCUSSION

Soil Amendment

About 90% of the farmers used crop rotation, bush fallowing and green manure (cover crops) which help to provide nitrogen through legumes such as groundnut and cowpea to fix nitrogen from the atmosphere through symbiosis with the bacteria rhizobia. Intercropping was also used for insect and disease control, and also increased soil nutrients with wider spacing between the crop rows. Crop residues are always ploughed back into the soil, and different weeds and plant leaves are also turned into the soil forming green manure. These Fulani communities equally use animal dung or farm yard manure in enriching the soils as shown in Figs 1, 2 and 3. Most of the farmers operate mixed farming which involves cropping and keeping of livestock. This assists in maintaining soil fertility without the use of chemical fertilizers, herbicides and pesticides. This study is in agreement with the findings of [8] and [9].

RESULTS



Figure 1: Fulani herd used to enrich soil for organic crop production



Figure 2: A heap of animal Dung for the enriching of soils



Figure 3: Herd where the animals stay and are moved to another place



Figure 4: The use of oxen for pre and post emergence weeding of farm lands



Figure 5: One of the herdsmen at his tent who most of the times participate in weeding farm land mornings and evenings before and after taking animals out for grazing.

Management of Animals

Animals are left on free-range throughout the year especially in areas with wide expanse of land. Camels feed diurnally or nocturnally and are unrivalled in their ability to utilize desert and semi-desert vegetation (with certain attributes; thorny, odorous and secretive) which are unpalatable and unacceptable or inaccessible to many other animals. Donkeys and oxen are fed with green fodder or concentrate and can utilize a wide range of agricultural by-products. During the rainy season, after the day's work or on work-free days, draught animals are allowed to graze natural forages in the surroundings. This is usually supplemented by cut-and-carry weeds which are usually fed to the animals in the late evening. The result is agreement with similar findings reported by [10], [11] and [12]. During the dry season when grasses were scarce and their quality low, some farmers feed their animals with farm residues. Potash and common salt are also given to supplement for mineral sources. Animal diseases and parasites are controlled traditionally through the use of herbs. The result agrees with that of [6] and [7].

Weed Control

Draught animals are found to be predominantly used with only few settled Fulani farmers using family labour and tractor for pre and post emergence weeding

of farm lands as can be seen in Figs 4 and 5. After the primary land preparation, animals operate in ridges with ploughs by covering and turning the soil on the weeds under the crops between rows allowing them to decay thereby serving as green manure. Implements used include normal mould boards for secondary tillage or weeding of farm lands. The few taller uncovered weeds were uprooted and the shorter crops buried were uncovered. The animals work on an average of six hours per day without much stress or reduction in output. Animals' droppings are also used to control weeds infestation. Animals are allowed to remain in a particular field for long during the dry season to fertilize the land and the manure suppresses the weeds on the land as can be seen in figs 1, 2, and 3. Millets are planted to control striga and or are uprooted manually. Out of 1,000 farmers contacted, none of them uses synthetic herbicides for weed control. Herbicides, pesticides and synthetic fertilizers are expensive and could burn and destroy their crops when wrongly used. It also causes environmental pollution and reduce soil micro flora. These findings are in agreement with that of [9] and [13]. Sowing and harvesting of crops are mostly done using family labour or manually.

Pests Control

Intercropping is used for insect and disease control, and also increased soil nutrients with wider spacing between the crop rows. Crop rotation and bush fallowing are also some of the techniques used in controlling host specific pests by staving them to death. Most of the farmers also keep poultry such as chickens, ducks and guinea fowls in free range system these help in taking care of most of the insect pest. Quella birds and rodents are scared away by the use of catapults and noise from drums and zincs. Traps are equally used.

Biodiversity

Organic crops use no herbicides, chemical fertilizers and pesticides and thus biodiversity fitness and population density also benefit. Many weed species attract beneficial insects that improve soil qualities. Soil- borne organisms often benefit because of increased bacterial populations due to natural fertilizer spread such as manure. A range of organisms benefit from organic farming for example birds, butterflies, soil microbes, beetles, earthworms, spiders. Vegetation and mammals are also positively affected. Farmers, who adopt organic methods, reduce risk of poor yield by promoting biodiversity. These findings are in conformity to that of [14].

Productivity and Profitability

Based on the interview conducted with the farmers, it was revealed that organic farms (livestock and crops) yield 70-90% better than ordinary farms or those farms that use synthetic herbicides, growth regulators, livestock feed additives, chemicals fertilizers and pesticides. Majority of the Fulani men interviewed said before now, that is 10 – 20 years ago, they were known to sell their animals to buy grains but now gone were those days that a Fulani man with an average of ten animals would depend on market for his food stuffs. They have settled down and are now high producers of food crops for their family use and the surplus for market. If given the opportunity, chance and the required awareness sooner or later they will feed the whole nation through organic farming. They spend virtually nothing in organic livestock and crop production but harvest bountifully at the end of every year.

They also confirmed that organic farms withstand harsh weather condition especially drought and diseases better, have low weed, pest and parasites infestation compared to conventional farms. Therefore, organic farming may be expensive at the initial stage but in the long run when livestock have increased it becomes less expensive and more profitable for virtually nothing is wasted within the cycle. The result also corroborates with that of [1].

Food Quality and Safety

Organic food crops, meat, milk and eggs are widely accepted and believed to be healthier with good taste than food produced using conventional methods. This is because organic food has no agrochemical residues which are dangerous to human health. Organic food crops appear to have higher natural form of vitamin C and lower nitrate concentration and so higher nutrients. This also gives the farmers peace of mind without any fear of food poisoning since no form of chemicals is used. The result also is in agreement with similar findings of [15].

CONCLUSION

In conclusion, organic farming is advantageous because of efficiency and high yielding, economic viability, food quality and safety, environmental and biodiversity safety. The only limitation is that, it is only possible to those farmers who practice mixed farming especially the Fulani men with higher number of livestock.

RECOMMENDATION

Government should create more awareness and encourage the practice of organic farming within the country since organic agriculture is the production system that sustains the productivity of soils, health of the ecosystems and people.

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